Assistant Director for Operations   14 January 1954

Chief, Foreign Documents Division

"Mechanical Translation"

        1. On 7 January 1954 I attended a demonstration of a
"Mechanical Translation" machine at the headquarters of the Inter-
national Business Machines Corporation, New York City. At this
demonstration Mr. Thomas J. Watson, Chairman of the Board, IBM,
presented the introductory remarks outlining his great interest
in this particular project and how they had placed it ahead of
several other projects pending at IBM. The project is a joint
one between the Institute of Languages and Linguistics of
Georgetown University and IBM. The project has involved linguistic
research on the part of [   ] and the adaptation by
IBM of their most recent Type 701 Electronic Data Processing Machine.
Following this there were remarks by [   ]
[   ] in which he described this demonstration as comparable to
Kitty Hawk. He clarified at the outset that it had been their aim
to produce a machine which would require neither pre-editing nor
postediting and this is what they have succeeded in doing in a
modest way. They have divided words into two basic parts, one which
carries meaning and the other which alters meaning. This is accom-
plished by one of six diacritical digital instructions. Thus, as
each word goes into the machine, the machine finds the word on the
storage drum and at the same time receives the accompanying diacriti-
cal instruction which informs the machine to invert after the next
word, insert other words not present in the original language but
required in English, etc. The machine then goes on automatically to
pull the corresponding English terminology and follow the diacritical
instruction resulting in an end-printing operation of the English
sentence. For this demonstration 250 words had been selected from a
number of Russian sentences. In the demonstration which followed a
typist was given the Russian sentences transliterated in English
letters and she proceeded to punch these sentences onto cards. The
cards were then taken from the typist and fed into the machine and
within about eight seconds the printer began printing the English
sentences. Following the demonstration [   ] summarized
briefly their objectives for the future. He stated that it would
be a minimum of three years for research to develop this machine for
practical operation. Their research would comprise determining what
he termed the "core language" which would be that portion of the
language which is common to all types of publications in that language.
This would then be supplemented by functionally specialized vocabu-
laries. Thus, it is envisaged that the "core language" would be
maintained at all times in the machine and the specialized vocabu-
laries apart on a magnetic tape. As translation of a specialized

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work is required, the vocabulary for this specialty would be fed into the machine at that time from its storage on the magnetic tape. At the present time [blank] said that they had no idea what the size of the "core language" would be.

2. I should like to add the following brief comments of my own:

a. The "machine" is actually eleven machines or units that would require a room about 30 x 15 feet. The units consist of a card-puncher, a punched-card reader, two electrostatic storage units, an electronic analytical control unit, a magnetic drum reader and recorder, two magnetic tape readers and recorders, a power control unit, an alphabetical printer, and a punched-card recorder. There was no estimate nor even an indication of the cost of this "machine."

b. This demonstration resulted from nine months intensive work by the cooperating organizations and yet only 250 words could be incorporated during this time. This does not detract from the fact that the machine could take Russian sentences of limited vocabulary and convert them without either pre-editing or postediting into clear understandable English. However, I

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don't believe [blank] estimate of three years for further research unduly pessimistic.

c. It must be clearly noted that the vocabulary, both Russian and its English equivalent, must be placed in the machine first before anything can be done. It must also be noted that the sentences used were all of a fairly basic straight-forward type. This does not minimize what has

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obviously been excellent research by [blank]

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[blank] on the handling of a number of syntactical problems, but merely points to the hard road ahead.

d. I believe the machine has demonstrated feasibility for straight-forward technical language translation. I believe its practicability for economic or political material, where more complex ideas are presented and there is a wider choice of words to fit the context of the sentence, remains yet to be demonstrated.

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Enclosures: 3
    Sample Punched-Card
    Sample of Russian Sentences
    Sample of End-Printing Operation

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